Consumer and Corporate Affairs Canada
Consommation et Corporations Canada

Best Available Copy

(11) (A) No. 1 186 286

(45) ISSUED 850430

(52) CLASS 214-90

(51) INT. CL.^{4} A01F 13/00,17/00

(19) (CA) CANADIAN PATENT (12)

(54) Bale Handler

(72) Hendrickson, Orris M.,
Canada

(21) APPLICATION No. 413,025

(22) FILED 821007

No. OF CLAIMS 4

Canada

DISTRIBUTED BY THE PATENT OFFICE, OTTAWA.
CCA-274 (11-82)

ABSTRACT OF THE DISCLOSURE

An apparatus for carrying round bales includes a rectangular frame defined by a pair of vertical posts, on which a carriage is slidably mounted. The carriage includes sleeves on the posts, and a pair of horizontal tines for insertion beneath a bale. A hydraulic cylinder is mounted on the frame for raising and lowering the carriage. Cables extend upwardly from each side of the base of the frame around pulleys mounted on the sides of the carriage to the rear axle of the towing vehicle. When the carriage is raised, the pulleys move upwardly causing the frame, carriage and tines to tilt forwardly from the bale loading position to an inclined bale transporting position.

THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

1. A bale handling apparatus for use with a towing vehicle of the type including a drawbar comprising substantially rectangular frame means; coupling means for pivotally connecting said frame means to said towing vehicle for rotation around a horizontal axis; carriage means telescopically mounted on said frame means for vertical movement on the frame means between a ground engaging lower lifting position and an elevated carrying position; fork means extending outwardly from said carriage means for carrying a bale; elevating means interconnecting said carriage means and said frame means, whereby upward movement of said carriage means causes tilting of said frame means, carriage means and fork means to the carrying position.

2. An apparatus according to claim 1, wherein said elevating means includes cylinder means extending between said frame means and said carriage means for moving said carriage means vertically with respect to said frame means; cable means for interconnecting said frame means and the towing vehicle; and pulley means mounted on said carriage means for receiving said cable means whereby upward movement of said carriage means with said pulley means causes tilting of said frame means, carriage means and fork means toward said carrying position.

3. An apparatus according to claim 1 or 2, wherein said frame means includes a pair of parallel side posts, and first crossbar means interconnecting said posts; and said carriage means including a pair of sleeves slidably mounted on said posts, and second crossbar means interconnecting said sleeves.

4. An apparatus according to claim 1 or 2 including vertically movable leg means on said frame means for supporting said frame means with said fork means in a ground engaging position to facilitate coupling of the apparatus to a towing vehicle.

This invention relates to a bale handling apparatus, and in particular to an apparatus for picking up and carrying a round bale.

There are literally dozens of bale handlers described in the patent literature. Examples of such bale handlers which most closely resemble the apparatus disclosed herein are found in United States Patents Nos. 3,985,246, issued to S. A. Seymour on October 12, 1976; 4,073,532, issued to C. B. Blair on February 14, 1978; and 4,256,426, issued to M. D. Buss on March 17, 1981. In general, the bale handlers described by these patents are somewhat complicated and difficult to install. Moreover, the prior art bale handlers are more or less permanently mounted on tractors. Vehicles having permanently attached bale handlers are of limited utility, i.e. the vehicles can be used for bale handling only. In order to free the vehicle for other uses, a simple, quick coupling device is required. Ideally, it should be possible to use the bale handling apparatus with a variety of tractors, without changing the apparatus.

The object of the present invention is to provide a bale handling apparatus, which is relatively simple in terms of structure and operation, and which can be used with a tractor equipped with a standard drawbar.

Accordingly, the present invention relates to a bale handling apparatus for use with a towing vehicle of the type including a drawbar comprising substantially rectangular frame means; coupling means for pivotally connecting said frame means to said towing vehicle for rotation around a horizontal axis when lowered into contact with the ground; carriage means telescopically mounted on said frame means for vertical movement on the frame means between a ground engaging lower lifting position and an elevated carrying position; fork means extending outwardly from said carriage means for carrying a bale; elevating means interconnecting said carriage means and said frame means, whereby upward movement of said carriage means causes tilting of said frame means to the carrying position.

The invention will now be described in greater detail with reference to the accompanying drawings, which illustrate a preferred embodiment of the invention, and wherein:

Figure 1 is a perspective view from above and the rear of a bale handler in accordance with the invention;

Figure 2 is a partly sectioned, perspective view from above of a portion of the bottom end of the bale handler of Figure 1, with parts removed;

Figure 3 is a perspective view from one side of the top rear end of the bale handler of Figures 1 and 2;

Figure 4 is a perspective view from above of the front end of the bale handler of Figures 1 to 3; and

Figures 5 to 7 are schematic side elevation views of the bale handler of Figures 1 to 4 showing the operation thereof.

In the following description of the invention, the sides of the bale handler closest to and farthest from the towing vehicle are identified as the "front" and "rear", respectively of the handler.

With reference to Figures 1 to 4, a bale handler in accordance with the present invention includes a rectangular frame generally indicated at 1. The frame 1 is defined by a pair of posts 2, which are interconnected at their top ends by a plate 3, and at their bottom ends by a crossbar 4 (Figure 4). A carriage generally indicated at 5 is telescopically mounted on the frame 1 for vertical movement with respect to the frame. The carriage 5 is defined by a pair of tubular side sleeves 6, which are slidably mounted on the posts 2. The sleeves 6 are open at their bottom ends so that they can slide upwardly on the posts 2 of the frame 1. A crossbar 7 extends between the top ends of the sleeves 6, and a crossbar 8 interconnects the bottoms of the sleeves.

A pair of vertically extending reinforcing beams 9 are provided on the bottom rear ends of the sleeves 6 for supporting a fork generally indicated at 10. The fork 10 includes a crossbar 11 and a pair of tines 12 extending rearwardly from the outer ends of the crossbar 11. The tines 12 are sufficiently long to support a circular bale 13 (Figures 5 to 7). Reinforcing gussets 14 extend between the tines 12 and the crossbar 11. A leg 15 is mounted at each end of the crossbar 11 on the front thereof. Each leg 15 is vertically movable in a bracket 16 (Figure 4) so that the legs can be lowered to the ground. The legs 15 are provided with holes 17 for receiving pins which lock the legs 15 in one position relative to the crossbar 11. The legs 15 are used for connecting and disconnecting the bale handler as described in greater detail hereinafter.

A hydraulic cylinder 18 is used to move the carriage 5 vertically with respect to the frame 1. A pair of arms 19 (Figure 4) extend forwardly from the bottom ends of the posts 2. The arms 19 are interconnected by the crossbar 4. The bottom end of the cylinder 18 is pivotally connected to the crossbar 4 by a clevis 20. A piston rod 21 (Figure 1) extends upwardly from the cylinder 18, and is connected to the carriage 5 by a bracket 22 and a clevis 23 (Figure 3). The bracket 22 includes front and back plates 24 and 25, respectively. Two vertical rows of holes 26 are provided in each of the plates 24 and 25 for receiving bolts 27 and nuts 28 for mounting the bracket 22 on the crossbar 7. The rows of holes 26 permit vertical adjustment of the carriage, depending upon the height of the drawbar of the tractor 30.

A bushing 31 is provided in the outer end of each arm 19 for receiving a stub axle 32. The axles 32 extend outwardly from the sides of a generally triangular frame 33. The frame 33 includes a longitudinally extending, rectangular socket 34 at the top thereof for receiving a similarly shaped tongue (not shown) on a bracket 35 for connecting the bale handler to the tractor 30. The tongue is retained in the socket 34 by a pin 36. As will be appreciated, socket 34 may be sized to accept various tongue configurations depending upon the model of tractor utilized.

The tongue is connected to the L-shaped bracket 35, the triangular vertical arm of which is pivotally connected to a coupling assembly for rotation around the horizontal axis defined by a sleeve 38. The sleeve 38 is mounted on a horizontal, arcuate towing arm 37 by a bracket connected to a bottom plate 39 by nuts and bolts 40. A plurality of holes 42 are provided in the arm 37 for adjustment to a variety of tractors, i.e. the handler can be moved transversely with respect to the arm 37. A pair of straight arms 43 connect the ends of the arm 37 to a rear axle 44 of the tractor 30. The forward ends of the arms 43 are pivotally connected to the axle 44 by clevises 45 (one shown). A second pair of straight arms 46 are pivotally connected at their top ends to the towbar 29 on the rear of the tractor 30, and at their bottom ends to the arms 43.

A pair of cables 48 extend between lugs 49 near the ends of the axle 44 and the top ends of short chains 50. The chains 50 are connected to the arms 19 by brackets 41 and pins 52, so that the length of the chain and cable combination can be adjusted to suit a variety of vehicles. The chains 50 pass around pulleys 53 mounted on the sleeves 6 of the carriage 5. The pulleys 53 are mounted in brackets 54, each of which is defined by a pair of parallel plates 55. The plates 55 are pivotally mounted for rotation around vertical axes between flanges 56 and

57 extending outwardly from the sleeves 6.

The operation of the bale handler will be described with reference to Figures 5 to 7. With the fork 10 in the lower, ground engaging position (Figure 5), the tractor 30 is backed toward the bale 13 so that the tines 12 slide beneath the bale. The cylinder 18 is actuated to cause the carriage 5 to move vertically, i.e. to slide upwardly on the posts 2 of the frame 1. As the carriage 5 moves vertically (Figure 6), the pulleys 53 move vertically away from the arms 19, which form the base of the frame 1. Such movement of the pulleys 53 relative to the arms 19 causes the frame 1 to tilt forwardly toward the tractor 30 (Figure 7). Thus, the bale 13 is lifted and tilted forwardly to reduce the likelihood of falling during transporting of the bale. In order to unload the bale 13, the procedure described above is reversed.

In order to remove the bale handler from the tractor 30, so that the tractor can be put to other uses, the fork 10 is lowered to the bottom position (Figure 5), cable 48 and chains 50 are then disconnected from the tractor at location 49. The cylinder 18 is actuated to raise the carriage 5, and the legs 15 are lowered so that the bottoms thereof engage the ground. The pin 36 is removed so that the drawbar can be pulled out of the socket 34, and the hydraulic hoses to the cylinder 18 are disconnected. Of course, to connect the bale handler to the rear end of the tractor 30, this procedure is reversed.

1186286

3-1.

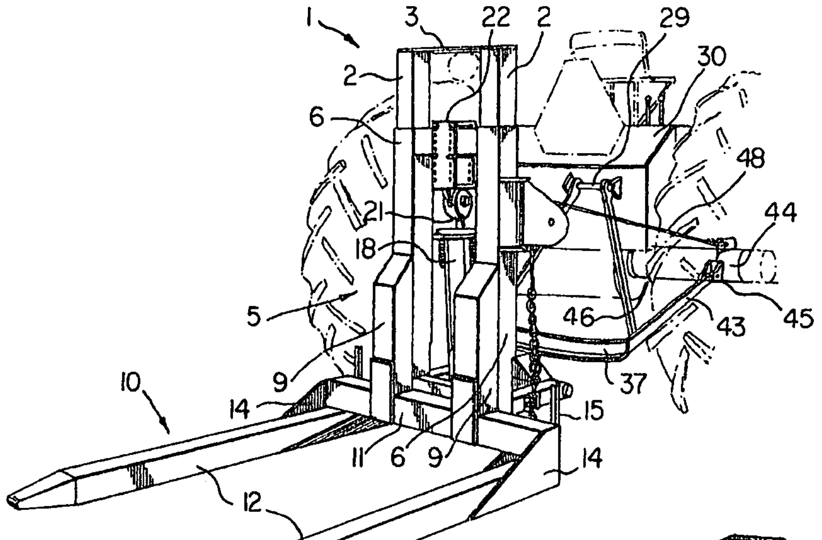

FIG. 1

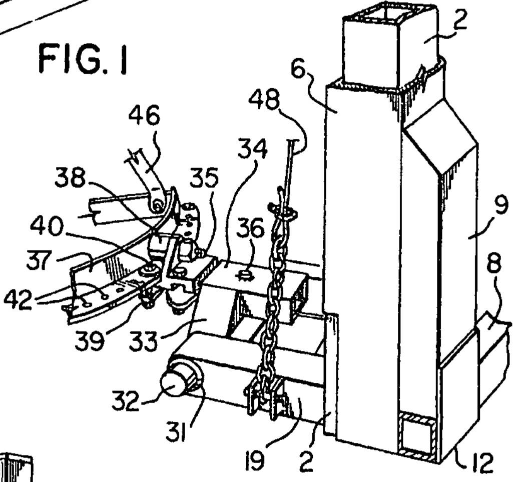

FIG. 2

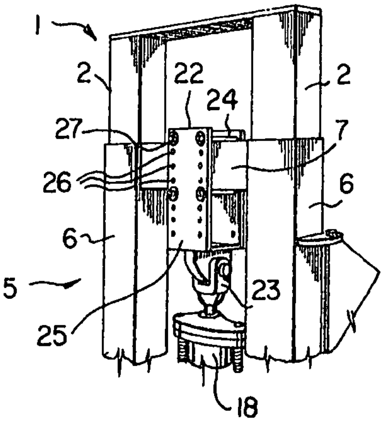

FIG. 3

Patent Agent
George H. Dunsmuir

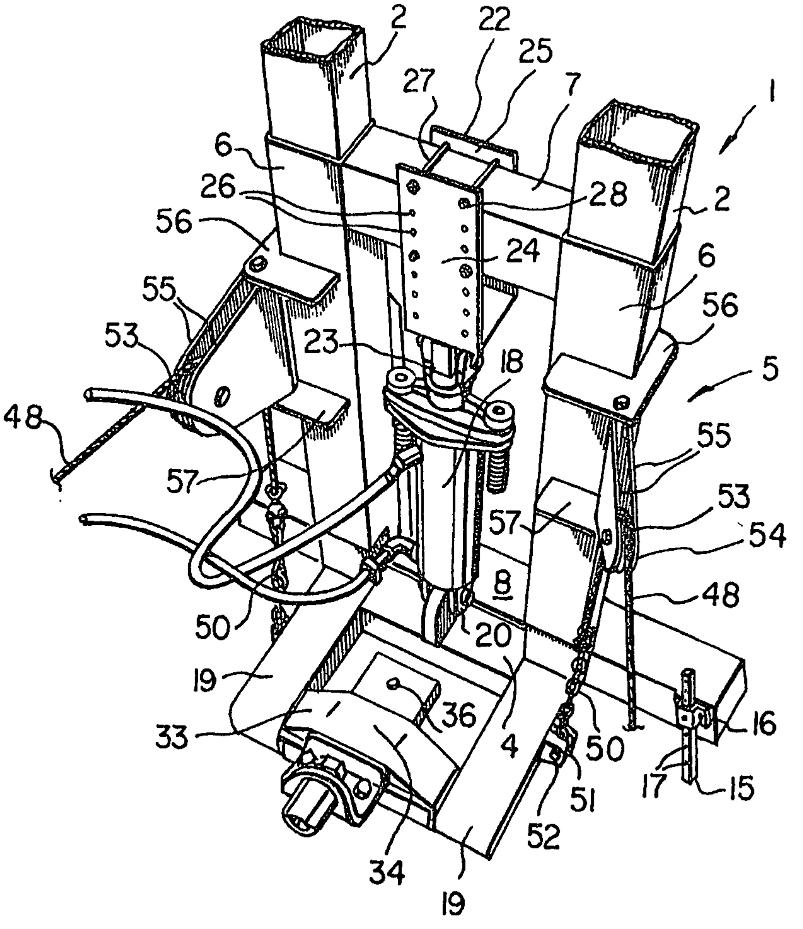

FIG. 4

Patent Agent.
George H. Dunsmuir

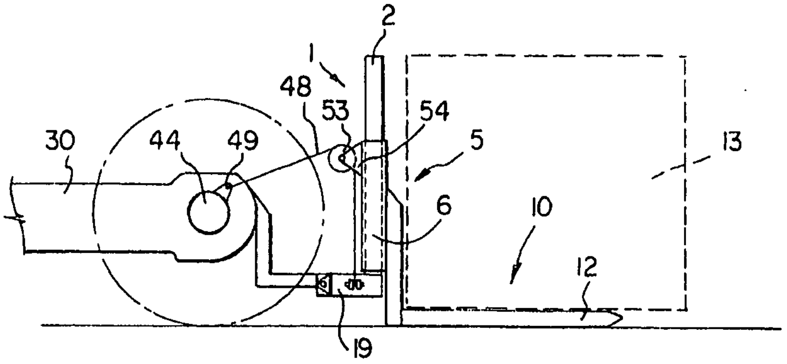

FIG.5

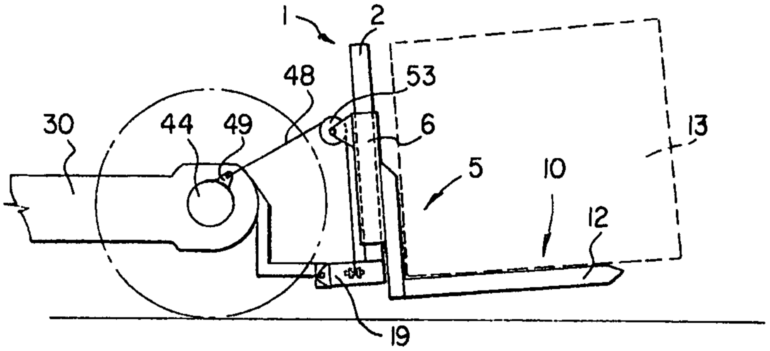

FIG. 6

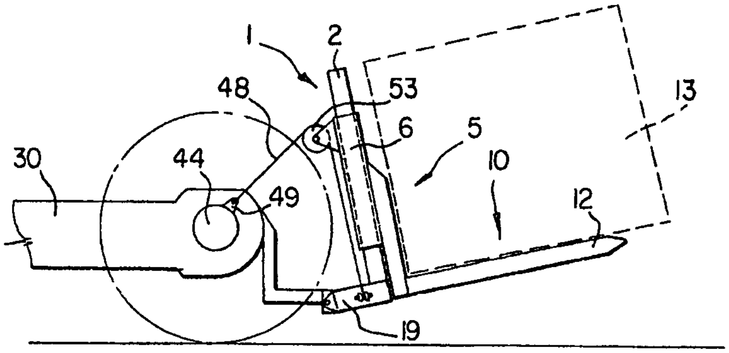

FIG. 7

Patent Agent.
George A. Dunsmuir